

# ELEMENTS

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## Unpainted Steel Elements

Element Number	Description
101	<b>Steel Closed Web/Box Girder, Unpainted (m)</b> This element defines only those steel closed web/box girder units that are not painted or are constructed of weathering steel or galvanized. <i>See Appendix, page A-4 for quantity conventions.</i>
106	<b>Steel Open Girder, Unpainted (m)</b> This element defines only those steel open girder units that are not painted or are constructed of weathering steel. <i>See Appendix, page A-4 for quantity conventions.</i>
112	<b>Steel Stringer, Unpainted (m)</b> This element defines all unpainted steel stringers which support the deck in a stringer-floor beam system. <i>See Appendix, page A-5 for quantity conventions.</i>
120	<b>Steel Bottom Chord of Through Truss, Unpainted (m)</b> This element defines the bottom chord of unpainted steel trusses or those constructed of weathering steel. This element includes through trusses and Pony trusses. <i>See Appendix, page A-6 for quantity conventions.</i>
125	<b>Steel Through Truss excluding bottom chord, Unpainted (m)</b> This element defines all truss elements except the bottom chord of unpainted steel trusses or those constructed of weathering steel. This element includes through trusses and Pony trusses. <i>See Appendix, page A-6 for quantity conventions.</i>
130	<b>Steel Deck Truss, Unpainted (m)</b> This element defines all members of unpainted steel deck trusses or those constructed of weathering steel. <i>See Appendix, page A-6 for quantity conventions.</i>
140	<b>Steel/Arch, Unpainted (m)</b> This element defines all members of only those steel arches that are not painted or are constructed of weathering steel. <i>See Appendix, page A-3 for quantity conventions.</i>
151	<b>Steel Floor Beam, Unpainted (m)</b> This element defines only those steel floor beams that are not painted or are constructed of weathering steel. <i>See Appendix, page A-5 for element determination.</i>
201	<b>Steel Column or Pile Extension, Unpainted (EA)</b> This element defines only those columns or pile extensions that are unpainted or constructed of weathering steel.
225	<b>Steel Submerged Pile (EA)</b> This element defines only those unpainted steel foundation piles that are submerged in soil or water. Piles that are completely submerged, in soil or water, and not visible for inspection, should typically be recorded as quantity 1 EA in condition state 1. If the foundation piles are partially visible for inspection, record the actual number of inspected piles and the corresponding condition states.
230	<b>Steel Pier Cap, Unpainted (m)</b> This element defines only those steel pier caps that are not painted or are constructed of weathering steel. <i>See Appendix, page A-5 for quantity conventions.</i>

# Unpainted Steel Elements

Condition	Description	Feasible Action
1	There is little or no corrosion of the unpainted steel. The weathering steel is coating uniformly and remains in excellent condition.	0 – Do Nothing
2	Surface rust, surface pitting, has formed or is forming on the unpainted steel. The weathering steel has not corroded beyond design limits. Weathering steel color is yellow-orange to light brown.	0 – Do Nothing 1 – Clean and paint
3	Steel has measureable section loss due to corrosion but does warrant structural analysis. Weathering steel is dark brown or black.	0 – Do Nothing 1 – Clean and paint
4	Corrosion is advanced. Section loss is sufficient to warrant structural analysis to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.	0 – Do Nothing 2 – Rehab unit 3 – Replace unit

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## Painted Steel Elements

Element Number	Description
102	<b>Steel Closed Web/Box Girder, Painted (m)</b> This element defines only those steel closed web/box girder units that are painted. <i>See Appendix, page A-4 for quantity conventions.</i>
107	<b>Steel Open Girder, Painted (m)</b> This element defines only those steel open girder units that are painted. This element includes two girder systems as well as rolled beams on multiple beam spans. <i>See Appendix, page A-3 for quantity conventions and Crossframe/Diaphragm conventions.</i>
113	<b>Steel Stringer, Painted (m)</b> This element defines only those steel stringers that support the deck in a stringer-floor beam system that are painted. <i>See Appendix, page A-5 for quantity conventions.</i>
121	<b>Steel Bottom Chord of Through Truss, Painted (m)</b> This element defines the bottom chord of steel trusses that are painted. This element includes through trusses and Pony trusses. <i>See Appendix, page A-6 for quantity conventions.</i>
126	<b>Steel Through Truss excluding bottom chord, Painted (m)</b> This element defines all truss elements except the bottom chord of steel trusses that are painted. This element includes through trusses and Pony trusses. <i>See Appendix, page A-6 for quantity conventions.</i>
131	<b>Steel Deck Truss, Painted (m)</b> This element defines all members of steel deck trusses that are painted. <i>See Appendix, page A-6 for quantity conventions.</i>
141	<b>Steel/Arch, Painted (m)</b> This element defines all members of only those steel arches that are painted. <i>See Appendix, page A-3 for quantity conventions.</i>
152	<b>Steel Floor Beam, Painted (m)</b> This element defines only those steel floor beams that are painted.
202	<b>Steel Column or Pile Extension, Painted (EA)</b> This element defines only those columns or pile extensions that are painted.
231	<b>Steel Pier Cap, Painted (m)</b> This element defines only those steel pier caps that are painted. <i>See Appendix, page A-5 for quantity conventions.</i>

# Painted Steel Elements

Condition	Description	Feasible Action
1	There is no evidence of active corrosion and the paint system is sound and functioning as intended to protect the metal surface.	0 - Do Nothing 1 - Surface clean
2	There is little or no active corrosion. The paint system may be chalking, peeling, curling or showing other early evidence of paint system distress but there is no exposure of metal.	0 - Do Nothing 1 - Surface clean 2 - Surface clean and restore top coat
3	Surface or freckled rust has formed or is forming. The paint system is no longer effective. There may be exposed metal but there is no active corrosion which is causing loss of section.	0 - Do Nothing 3 - Spot blast, clean and paint
4	The paint system has failed. Surface pitting may be present but any section loss due to active corrosion does not yet warrant structural analysis of either the element or the bridge.	0 - Do Nothing 3 - Spot blast, clean and paint 4 - Replace paint system
5	Corrosion has caused section loss and is sufficient to warrant structural analysis to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.	0 - Do Nothing 5 - Major rehab unit 6 - Replace unit

## Notes

- ***If steel was pitted but was thoroughly cleaned and repainted, and the paint is holding up well, the condition code can be increased to a better code (but use smart flag 363).***
- ***Poor condition paint on one portion of a girder (such as the bottom flange) means that the entire linear meter of beam in that area can be rated to the condition of the worst portion.***

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## Prestressed Concrete Elements

Element Number	Description
104	<b>Prestressed Concrete Closed Web/Box Girder (m)</b> This element defines only those closed web/box girder units constructed of prestressed concrete. <i>See Appendix, page A-4 for quantity conventions.</i>
109	<b>Prestressed Concrete Open Girder (m)</b> This element defines only those prestressed concrete open girder units constructed of prestressed concrete. <i>See Appendix, page A-5 for quantity conventions.</i>
115	<b>Prestressed Concrete Stringer (m)</b> This element defines only those prestressed concrete stringers that support the deck in a stringer-floor beam system. <i>See Appendix 4 for quantity conventions.</i>
143	<b>Prestressed Concrete Arch (m)</b> This element defines only those arches constructed of prestressed concrete. <i>See Appendix, page A-3 for quantity conventions.</i>
154	<b>Prestressed Concrete Floor Beam (m)</b> This element defines only those floor beams constructed of prestressed concrete.
204	<b>Prestressed Concrete Column or Pile Extension (EA)</b> This element defines only those columns or pile extensions that are constructed of prestressed concrete. If the pile type is different than the extension type; record the extension type.
226	<b>Prestressed Concrete Submerged Pile (EA)</b> This element defines only those prestressed concrete piles that are submerged in soil or water. Piles that are completely submerged, in soil or water, and not visible for inspection, should typically be recorded as quantity 1 EA in condition state 1. If the foundation piles are partially visible for inspection, record the actual number of inspected piles and the corresponding condition states.
233	<b>Prestressed Concrete Pier Cap (m)</b> This element defines only those pier caps that are constructed of prestressed concrete and not integral with the superstructure (has a bearing surface). <i>See Appendix, pages A-3 and A-4 for quantity conventions.</i>

# Prestressed Concrete Elements

Condition	Description	Feasible Action
1	The element shows no deterioration. There may be discoloration, efflorescence, and/or superficial cracking but without affect on strength and/or serviceability.	0 – Do Nothing
2	Minor cracks and spalls may be present and there may be exposed reinforcing with no evidence of corrosion. There is no exposure of the prestress system.	0 – Do Nothing 1 – Seal cracks minor patch
3	Some delaminations and/or spalls may be present. There may be minor exposure but no deterioration of the prestress system. Corrosion of non-prestressed reinforcement may be present but loss of section is incidental and does not significantly affect the strength and/or serviceability of either the element or the bridge.	0 – Do Nothing 2 – Clean steel and patch, (and/or seal)
4	Delaminations, spalls and corrosion of non-prestressed reinforcement are prevalent. There may also be exposure and deterioration of the prestress system (manifested by loss of bond, broken strands or wire, failed anchorages, etc.). There is sufficient concern to warrant an analysis to ascertain the impact on the strength and/or serviceability of either the element or the bridge.	0 – Do Nothing 3 – Rehab unit 4 – Replace unit

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## Reinforced Concrete Elements

Element Number	Description
105	<b>Reinforced Concrete Closed Web/Box Girder (m)</b> This element defines only those closed web/box girder units constructed of reinforced concrete. <i>See Appendix, page A-4 for quantity conventions.</i>
110	<b>Reinforced Concrete Open Girder (m)</b> This element defines only those reinforced concrete open girder units constructed of reinforced concrete. This can include deck girders, T girders and through girders. <i>See Appendix, page A-4 for quantity conventions.</i>
116	<b>Reinforced Concrete Stringer (m)</b> This element defines only those reinforced concrete stringers that support the deck in a stringer-floor beam system. <i>See Appendix, page A-5 for quantity conventions.</i>
144	<b>Concrete Arch (m)</b> This element defines only those arches (open/closed spandrel, earth filled, bowstring, etc.) constructed of reinforced concrete. <i>See Appendix, page A-3 for quantity conventions.</i>
155	<b>Reinforced Concrete Floor Beam (m)</b> This element defines only those floor beams constructed of reinforced concrete.
205	<b>Reinforced Concrete Column or Pile Extension (EA)</b> This element defines only those columns or pile extensions that are constructed of reinforced concrete. If the pile type is different than the extension type; record the extension type.
210	<b>Reinforced Concrete Pier Wall (m)</b> This element defines only those pier walls constructed of reinforced concrete. This element includes multi-column bents with full height in fill or debris walls. Partial height walls between columns should be neglected (record the columns only). <i>See Appendix, page A-3 for "skew" conventions.</i>
215	<b>Reinforced Concrete Abutment (m)</b> This element defines only those abutments constructed of reinforced concrete. <i>See Appendix, page A-3 for "skew" conventions.</i>
220	<b>Reinforced Concrete Submerged Pile Cap/Footing (EA)</b> This element defines only those reinforced concrete pile caps and/or footings that are continuously submerged and are visible for inspection. The exposure may be intentional or caused by scour.
227	<b>Reinforced Concrete Submerged Pile (EA)</b> This element defines only those reinforced concrete piles that are submerged in soil or water. Piles that are completely submerged, in soil or water, and not visible for inspection, should typically be recorded as quantity 1 EA in condition state 1. If the foundation piles are partially visible for inspection, record the actual number of inspected piles and the corresponding condition states.
234	<b>Reinforced Concrete Pier Cap (m)</b> This element defines only those pier caps that are constructed of reinforced concrete. <i>See Appendix, page A-3 and A-4 for "skew" and quantity conventions.</i>



# Reinforced Concrete Elements

Condition	Description	Feasible Action
1	The element shows no deterioration. There may be discoloration, efflorescence, and/or superficial cracking, but without affect on strength and/or serviceability.	0 – Do Nothing
2	Minor cracks and spalls may be present but there is no exposed reinforcing or surface evidence of rebar corrosion.	0 – Do Nothing 1 – Seal cracks minor patch
3	Some delaminations and/or spalls may be present and some reinforcing may be exposed. Corrosion of rebar may be present but loss of section is incidental and does not significantly affect the strength and/or serviceability of either the element or the bridge.	0 – Do Nothing 2 – Clean rebar and patch, (and/or seal)
4	Advanced deterioration. Corrosion of reinforcement and/or loss of concrete section is sufficient to warrant analysis to ascertain the impact on the strength and/or serviceability of either the element or the bridge.	0 – Do Nothing 3 – Rehab unit 4 – Replace unit

## Notes

- ***The condition state language for reinforced concrete allows “superficial cracking”. These cracks are the small hairline cracks which often are evident even in new concrete.***
- ***The condition state language for reinforced concrete mentions “minor cracking”. These cracks are 0.5 mm wide or wider.***
- ***Condition language in State #4 refers to “warrants analysis...”. Guidelines for meeting this condition are when reinforcing bars are exposed and there is greater than 10% section loss of the steel.***

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## Timber Elements

Element Number	Description
111	<b>Timber Open Girder (m)</b> This element is not currently used at CALTRANS. This element defines only those open girders of timber construction. This can include either solid timbers or glue-lam girders.
117	<b>Timber Stringer (m)</b> This element defines only those timber stringers that support the deck in a stringer-floor beam system. <i>See Appendix, page A-5 for quantity conventions.</i>
135	<b>Timber Truss/Arch (m)</b> This element defines all members of trusses and arches that are constructed of timber. <i>See Appendix, page A-3 for quantity conventions.</i>
156	<b>Timber Floor Beam (m)</b> This element defines only those floor beams constructed of timber.
206	<b>Timber Column or Pile Extension (EA)</b> This element defines only those columns or pile extensions that are constructed of timber. If the pile type is different than the extension type; record the extension type.
216	<b>Timber Abutment (m)</b> This element defines only those abutments constructed of timber. <i>See Appendix, pages A-3 and A-4 for further element guidance and quantity conventions.</i>
228	<b>Timber Submerged Pile (EA)</b> This element defines only those timber piles that are submerged in soil or water. Piles that are completely submerged, in soil or water, and not visible for inspection, should typically be recorded as quantity 1 EA in condition state 1. If the foundation piles are partially visible for inspection, record the actual number of inspected piles and the corresponding condition states.
235	<b>Timber Pier Cap (m)</b> This element defines only those pier caps that are constructed of timber. <i>See Appendix, pages A-3 and A-4 for quantity conventions.</i>

# Timber Elements

Condition	Description	Feasible Action
1	Investigation indicates no decay. There may be superficial cracks, splits and checks having no affect on strength or serviceability.	0 – Do Nothing
2	Decay, insect infestation/marine bore infestation, splitting, cracking or crushing may exist but none is sufficiently advanced to affect serviceability of the element.	0 – Do Nothing 1 – Rehab protect unit
3	Decay, insect infestation, splitting, cracking or crushing has produced loss of strength of the element but not of a sufficient magnitude to affect the serviceability of the bridge.	0 – Do Nothing 1 – Rehab unit 2 – Replace unit
4	Advanced deterioration. Decay, insect infestation, splits, cracks or crushing has produced loss of strength that affects the serviceability of the bridge.	0 – Do Nothing 1 – Rehab unit 2 – Replace unit

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## "Other" Superstructure/Substructure Elements

Element Number	Description
145	<b>Arch (Other Material) (m)</b> This element defines only those arches (open/closed spandrel, earth filled, bowstring, etc.) constructed of "other material" types (i.e., stone masonry). <i>See Appendix, page A-3 for quantity conventions.</i>
211	<b>Pier Wall (Other Material) (m)</b> This element defines only those pier walls (shafts) constructed of material other than reinforced concrete. This includes masonry pier walls. <i>See Appendix, page A-3 for "skew".</i>
217	<b>Abutment (Other Material) (m)</b> This element defines abutments made of masonry or any other material except concrete or timber. <i>See Appendix, page A-3 for accounting "skew".</i>

## "Other" Superstructure/Substructure Elements

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Condition	Description	Feasible Action
1	There is little or no deterioration. Surface defects only are in evidence.	0 - Do Nothing
2	There may be minor deterioration, cracking and weathering. Mortar in joints may show minor deterioration.	0 - Do Nothing 1 - Rehab unit
3	Moderate to major deterioration and cracking. Major deterioration of joints.	0 - Do Nothing 1 - Rehab unit
4	Major deterioration, splitting, or cracking of materials may be affecting the structural capacity of the element.	0 - Do Nothing 1 - Rehab unit 2 - Replace unit

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## Concrete Deck – Bare (sq. m)

## Concrete Slab – Bare (sq. m)

This element defines those concrete bridge decks/slabs with no surface protection of any type and constructed with uncoated reinforcement. Report the condition state that represents the condition of the entire deck.

Condition	Description	Feasible Action
1	The surface of the deck has no patched areas and there are no spalls/delaminations in the deck surface.	0 – Do Nothing 1 – Add a protective system
2	Patched areas and/or spalls/delaminations exist in the deck surface. The combined distressed area is 2% or less of the deck area.	0 – Do Nothing 1 – Add a protective system 2 – Repair spalls and delaminations
3	Patched areas and/or spalls/delaminations exist in the deck surface. The combined area of distress is more than 2% but less than 10% of the total deck area.	0 – Do Nothing 2 – Repair spalls and delaminations 3 – Repair spalls and delaminations and/or add a protective system on entire deck
4	Patched areas and/or spalls/delaminations exist in the deck surface. The combined area of distress is more than 10% but less than 25% of the total deck area.	0 – Do Nothing 2 – Repair spalls and delaminations 3 – Repair spalls and delaminations and/or add a protective system on entire deck
5	Patched areas and/or spalls/delaminations exist. The combined area of distress is more than 25% of the total deck area.	0 – Do Nothing 3 – Repair spalls and delaminations and/or add a protective system on entire deck 4 – Replace deck

### Notes

- ***The entire quantity shall be placed in one condition state***
- ***Only rate the TOP or WEARING SURFACE, any full depth deterioration is taken care of with the “Soffit or Underside of Deck” Smart Flag (Element 359, page 66).***
- ***The deck rating only includes spalls/delaminations or repaired areas. Both top and bottom deck cracking can be tracked as smart flags (Elements 358 and 359).***
- ***The deck area within 1/2 meter of all joints should be recorded as part of the joint element.***
- ***Patched areas are repaired areas that are expected to have less durability than the surrounding deck material and are considered temporary. Chipping out and repouring would not be considered a temporary patch.***

## Concrete Deck – Unprotected with AC Overlay (sq. m)

## Concrete Slab – Unprotected with AC Overlay (sq. m)

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This element defines those concrete bridge decks/slabs with no surface protection of any type. The deck is covered with an asphaltic concrete overlay.

Condition	Descriptions	Feasible Action
1	The surfacing on the deck has no patched areas and there are no potholes in this surfacing.	0 – Do Nothing
2	Patched areas and/or potholes or impending potholes exist. Their combined area is less than 2% of the deck area.	0 – Do Nothing 1 – Repair potholes and substrate
3	Patched areas and/or potholes or impending potholes exist. Their combined area is more than 2% but less than 10% of the total deck area.	0 – Do Nothing 1 – Repair potholes and substrate 2 – Repair substrate and replace overlay
4	Patched areas and/or potholes or impending potholes exist. Their combined area is more than 10% but less than 25% of the total deck area.	0 – Do Nothing 1 – Repair potholes and substrate 2 – Repair substrate and replace overlay
5	Patched areas and/or potholes or impending potholes exist. Their combined area is more than 25% of the total deck area.	0 – Do Nothing 2 – Repair substrate and replace overlay 3 – Replace deck

### Notes

- ***The entire quantity shall be placed in one condition state***
- ***Only rate the TOP or WEARING SURFACE, any full depth deterioration is taken care of with the “Soffit or Underside of Deck” Smart Flag (Element 359, page 66).***
- ***The deck rating only includes spalls/delaminations or repaired areas***
- ***Bottom of deck cracking can be tracked as a smart flag (Elements 358 and 359).***
- ***Patched areas are repaired areas that are expected to have less durability than the surrounding deck material and are considered temporary. Chipping out and repouring would not be considered a temporary patch.***

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## Concrete Deck – Protected with AC Overlay (sq. m) Concrete Slab – Protected with AC Overlay (sq. m)

This element defines those concrete bridge decks/slabs protected with a membrane. The membrane is covered with an asphaltic concrete overlay.

Condition	Description	Feasible Action
1	The surfacing on the deck has no patched areas and there are no potholes in this surfacing.	0 – Do Nothing
2	Patched areas and/or potholes or impending potholes exist. Their combined area is less than 2% of the deck area.	0 – Do Nothing 1 – Repair potholes
3	Patched areas and/or potholes or impending potholes exist. Their combined area is more than 2% but less than 10% of the total deck area.	0 – Do Nothing 1 – Repair potholes 2 – Replace overlay
4	Patched areas and/or potholes or impending potholes exist. Their combined area is more than 10% but less than 25% of the total deck area.	0 – Do Nothing 1 – Repair potholes 3 – Replace overlay and protective system
5	Patched areas and/or potholes or impending potholes exist. Their combined area is more than 25% of the total deck area.	0 – Do Nothing 3 – Replace overlay and protective system 4 – Replace deck

### Notes

- ***The entire quantity shall be placed in one condition state***
- ***Only rate the TOP or WEARING SURFACE, any full depth deterioration is taken care of with the “Soffit or Underside of Deck” Smart Flag. Also, the deck rating only includes spalls/delaminations. Bottom of deck cracking is tracked as a smart flag***
- ***“Protected” indicates the presence of a waterproofing membrane or similar protection system.***
- ***Patched areas are repaired areas that are expected to have less durability than the surrounding deck material and are considered temporary. Chipping out and repouring would not be considered a temporary patch.***



# Concrete Deck – Protected with Thin Overlay (sq. m)

## Concrete Slab – Protected with Thin Overlay (sq. m)

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This element defines those concrete bridge decks/slabs protected with a thin (less than 1") overlay (Portland cement, epoxy, resin, etc.)

Condition	Description	Feasible Action
1	The surface of the deck has no patched areas and there are no spalls/delaminations in the deck surface. No wear-out is visible.	0 – Do Nothing
2	Patched areas and/or spalls/delaminations exist in the deck surface. The combined distressed area is 2% or less of the deck area.	0 – Do Nothing 1 – Repair spalls and delaminations
3	Patched areas and/or spalls/delaminations exist in the deck surface. The combined area of distress is more than 2% but less than 10% of the total deck area.	0 – Do Nothing 1 – Repair spalls and delaminations
4	Patched areas and/or spalls/delaminations exist in the deck surface. The combined area of distress is more than 10% but less than 25% of the total deck area.	0 – Do Nothing 1 – Repair spalls and delaminations 2 – Replace overlay
5	Patched areas and/or spalls/delaminations exist. The combined area of distress is more than 25% of the total deck area.	0 – Do Nothing 2 – Replace overlay 3 – Replace deck

### Notes

- ***The entire quantity shall be placed in one condition state***
- ***Only rate the TOP or WEARING SURFACE, any full depth deterioration is taken care of with the “Soffit or Underside of Deck” Smart Flag Also, the deck rating only includes spalls/delaminations***
- ***Both top and bottom of deck cracking are tracked as smart flags (Elements 358 and 359).***
- ***This element is not intended for use on bridges with polyester concrete overlays (use Element 22).***
- ***Patched areas are repaired areas that are expected to have less durability than the surrounding deck material and are considered temporary. Chipping out and repouring would not be considered a temporary patch.***

## Concrete Deck – Protected with Rigid Overlay (sq. m)

## Concrete Slab – Protected with Rigid Overlay (sq. m)

This element defines those concrete bridge decks/slabs protected with a rigid (greater than 1") overlay (low slump Portland cement, epoxy, resin, polyester concrete, etc.)

Condition	Description	Feasible Action
1	The surface of the deck has no patched areas and there are no spalls/delaminations in the deck surface. No wear-out is visible.	0 – Do Nothing
2	Patched areas and/or spalls/delaminations exist in the deck surface. The combined distressed area is 2% or less of the deck area.	0 – Do Nothing 1 – Repair spalls and delaminations
3	Patched areas and/or spalls/delaminations exist in the deck surface. The combined area of distress is more than 2% but less than 10% of the total deck area.	0 – Do Nothing 1 – Repair spalls and delaminations
4	Patched areas and/or spalls/delaminations exist in the deck surface. The combined area of distress is more than 10% but less than 25% of the total deck area.	0 – Do Nothing 1 – Repair spalls and delaminations 2 – Replace overlay
5	Patched areas and/or spalls/delaminations exist. The combined area of distress is more than 25% of the total deck area.	0 – Do Nothing 2 – Replace overlay 3 – Replace deck

### Notes

- ***The entire quantity shall be placed in one condition state***
- ***Only rate the TOP or WEARING SURFACE, any full depth deterioration is taken care of with the "Soffit or Underside of Deck" Smart Flag. Also, the deck rating only includes spalls/delaminations. Both top and bottom of deck cracking are tracked as smart flags***
- ***The deck area within 1/2 meter of all joints should be recorded as part of the joint element.***
- ***Patched areas are repaired areas that are expected to have less durability than the surrounding deck material and are considered temporary. Chipping out and repouring would not be considered a temporary patch.***

# Concrete Deck – Protected with Coated Bars (sq. m)

## Concrete Slab – Protected with Coated Bars (sq. m)

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This element defines those concrete bridge decks/slabs constructed with coated (epoxy, galvanized, stainless steel, etc.) reinforcement bars.

Condition	Description	Feasible Action
1	The surface of the deck has no patched areas and there are no spalls/delaminations in the deck surface.	0 – Do Nothing 1 – Add a protective system
2	Patched areas and/or spalls/delaminations exist in the deck surface. The combined distressed area is 2% or less of the deck area.	0 – Do Nothing 1 – Add a protective system 2 – Repair spalls and delaminations
3	Patched areas and/or spalls/delaminations exist in the deck surface. The combined area of distress is more than 2% but less than 10% of the total deck area.	0 – Do Nothing 2 – Repair spalls and delaminations 3 – Repair spalls and delaminations and add or replace overlay
4	Patched areas and/or spalls/delaminations exist in the deck surface. The combined area of distress is more than 10% but less than 25% of the total deck area.	0 – Do Nothing 2 – Repair spalls and delaminations 3 – Repair spalls and delaminations and add or replace overlay
5	Patched areas and/or spalls/delaminations exist. The combined area of distress is more than 25% of the total deck area.	0 – Do Nothing 3 – Repair spalls and delaminations and add or replace overlay 4 – Replace deck

### Notes

- ***The entire quantity shall be placed in one condition state***
- ***Only rate the TOP or WEARING SURFACE, any full depth deterioration is taken care of with the “Soffit or Underside of Deck” Smart Flag Also, the deck rating only includes spalls/delaminations***
- ***Both top and bottom of deck cracking are tracked as smart flags (Elements 358 and 359)***
- ***The deck area within 1/2 meter of all joints should be recorded as part of the joint element.***
- ***Patched areas are repaired areas that are expected to have less durability than the surrounding deck material and are considered temporary. Chipping out and repouring would not be considered a temporary patch.***

## Concrete Deck – Protected with Cathodic Protection (sq. m)

## Concrete Slab – Protected with Cathodic Protection (sq. m)

This element defines those concrete bridge decks/slabs protected with a cathodic system.

Condition	Description	Feasible Action
1	The surface of the deck has no patched areas and there are no spalls/delaminations in the deck surface.	0 – Do Nothing 1 – Add a protective system
2	Patched areas and/or spalls/delaminations exist in the deck surface. The combined distressed area is 2% or less of the deck area.	0 – Do Nothing 1 – Add a protective system 2 – Repair spalls and delaminations
3	Patched areas and/or spalls/delaminations exist in the deck surface. The combined area of distress is more than 2% but less than 10% of the total deck area.	0 – Do Nothing 2 – Repair spalls and delaminations 3 – Repair spalls and delaminations and add or replace overlay
4	Patched areas and/or spalls/delaminations exist in the deck surface. The combined area of distress is more than 10% but less than 25% of the total deck area.	0 – Do Nothing 2 – Repair spalls and delaminations 3 – Repair spalls and delaminations and add or replace overlay
5	Patched areas and/or spalls/delaminations exist. The combined area of distress is more than 25% of the total deck area.	0 – Do Nothing 3 – Repair spalls and delaminations and add or replace overlay 4 – Replace deck

### Notes

- ***The entire quantity shall be placed in one condition state***
- ***Only rate the TOP or WEARING SURFACE, any full depth deterioration is taken care of with the “Soffit or Underside of Deck” Smart Flag (Element 359, page 66).***
- ***The deck rating only includes spalls/delaminations and repaired areas***
- ***Both top and bottom deck cracking can be tracked using smart flags (Elements 358 and 359).***
- ***The deck area within 1/2 meter of all joints should be recorded as part of the joint element.***
- ***Patched areas are repaired areas that are expected to have less durability than the surrounding deck material and are considered temporary. Chipping out and repouring would not be considered a temporary patch.***

# Open Grid Steel Deck (sq. m)

28

This element defines those bridge decks that are constructed of steel grids that are open and unfilled.

Condition	Description	Feasible Action
1	There is no corrosion. The paint system, if any, is sound. The connectors (welds, rivets, etc.) are sound.	0 – Do Nothing
2	There is little or no corrosion. The paint system, if any, may be showing early signs of distress. The connectors are still sound. The combined distressed area is 2% or less of the deck area.	0 – Do Nothing 1 – Surface clean
3	Surface or freckled rust has formed. The paint system is no longer fully effective. There is no loss of section. The connectors may be starting to show signs of distress—cracked welds or broken rivets. The combined area of distress is more than 2% but less than 10% of the total deck area.	0 – Do Nothing 2 – Surface clean and restore top coat 3 – Rehab connectors
4	Corrosion is moderate. Surface pitting may be present but any section loss is incidental. Numerous connectors are failing at scattered locations. The strength or serviceability of the section is not yet affected. The combined area of distress is more than 10% but less than 25% of the total deck area.	0 – Do Nothing 3 – Rehab connectors 4 – Spot blast, clean and paint
5	Corrosion is advanced. Numerous connectors have failed. Section loss and/or connectivity is sufficient to warrant analysis to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.	0 – Do Nothing 5 – Rehab connectors and replace paint system 6 – Replace unit

## Notes

- ***The entire quantity shall be placed in one condition state***

## Concrete Filled Grid Steel Deck (sq. m)

This element defines those bridge decks that are constructed of steel grids with either all of the openings or just those in the wheel tracks filled with concrete.

Condition	Description	Feasible Action
1	There is no corrosion. The paint system, if any, is sound. The connectors ( welds, rivets, etc.) are sound. The concrete filler is sound.	0 - Do Nothing
2	There is little or no corrosion. The paint system, if any, may be showing early signs of distress. The connectors are still sound. The concrete filler is sound. The combined distressed area is 2% or less of the deck area.	0 - Do Nothing 1 - Surface clean
3	Surface or freckled rust has formed. The paint system is no longer fully effective. There is no loss of section. The connectors may be starting to show signs of distress—cracked welds or broken rivets. The concrete filler may have broken out at scattered locations. The combined area of distress is more than 2% but less than 10% of the total deck area.	0 - Do Nothing 2 - Surface clean and restore top coat 3 - Rehab connectors and concrete filler
4	Surface or freckled rust has formed. The paint system is no longer fully effective. There is no loss of section. Numerous connectors are failing at scattered locations. Small areas of concrete are missing. The combined area of distress is more than 10% but less than 25% of the total deck area.	0 - Do Nothing 3 - Spot blast, clean and paint 4 - Rehab connectors and concrete filler
5	Corrosion is advanced. Numerous connectors have failed. Section loss and/or connectivity is sufficient to warrant analysis to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge. Much of the concrete filler is missing.	0 - Do Nothing 5 - Rehab connectors and concrete filler and replace paint system 6 - Replace unit

### Notes

- ***The entire quantity shall be placed in one condition state***

## Corrugated/Orthotropic Deck (sq. m)

30

This element defines those bridge decks that are constructed of corrugated metal filled with Portland Cement Concrete or asphaltic concrete or an orthotropic steel deck.

Condition	Description	Feasible Action
1	There is no evidence of corrosion and any paint systems are sound and functioning as intended to protect the metal surface. The surfacing, if any, on the deck has no repaired areas and there are no potholes.	0 - Do Nothing
2	There is little or no corrosion. Any paint systems may be showing early signs of distress. Minor cracking or potholes may exist in the surfacing. The combined distressed area is 2% or less of the deck area.	0 - Do Nothing 1 - Seal cracks and/or repair potholes
3	Surface or freckle rust has formed. There is no loss of section. Potholes exist in the surfacing and there may be significant cracking. The combined area of distress is more than 2% but less than 10% of the total deck area.	0 - Do Nothing 1 - Seal cracks and/or repair potholes 2 - Surface clean and restore top coat of paint
4	The paint system has failed. Surface pitting may be present but any section loss is incidental. Potholes may be large and expose the metal decking. The combined area of distress is more than 10% but less than 25% of the total deck area.	0 - Do Nothing 3 - Spot blast, clean and paint - repair potholes 4 - Replace paint system and/or replace surfacing
5	Corrosion is advanced. Section loss is sufficient to warrant analysis to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge. The surfacing has failed.	0 - Do Nothing 5 - Rehab, replace paint system, replace surfacing 6 - Replace unit

### Notes

- ***The entire quantity shall be placed in one condition state***
- ***This element is intended for steel corrugated decks with an asphalt or concrete riding surface***

## Timber Deck Bare (sq. m)

This element defines those bridge decks that are constructed of timber and are not overlaid.

Condition	Description	Feasible Action
1	Investigation indicates no decay. There may be cracks, splits and checks having no effect on strength or serviceability.	0 – Do Nothing
2	Decay, insect infestation, splitting, cracking or crushing may exist but none is sufficiently advanced to affect serviceability or strength.	0 – Do Nothing 1 – Rehab and/or protect deck
3	Decay, insect infestation, splitting cracking or crushing has produced loss of strength of the element but not of sufficient magnitude to affect the serviceability of the bridge.	0 – Do Nothing 1 – Rehab and/or protect deck 2 – Replace deck
4	Advanced deterioration. Decay, insect infestation, splits, cracks or crushing has produced loss of strength that affects the serviceability of the bridge.	0 – Do Nothing 2 – Replace deck

### Notes

- ***The entire quantity shall be placed in one condition state***
- ***Wheel line wear should be recorded as follows***
  - State 1 – No wheel line wear:***
  - State 2 – Wheel line wear is present but not significant.***
  - State 3 – Wheel line wear has worn 12 mm or deeper but does not effect serviceability.***
  - State 4 – Wheel line wear warrants analysis for member strength for traffic safety***



## Timber Deck – with AC Overlay (sq. m)

32

This element defines those bridge decks that are constructed of timber and are overlaid with asphaltic concrete.

Condition	Description	Feasible Action
1	Investigation indicates no decay. There may be cracks, splits and checks having no effect on strength or serviceability. There are no potholes in the surfacing.	0 – Do Nothing
2	Decay, insect infestation, splitting, cracking or crushing may exist but none is sufficiently advanced to affect serviceability. There may be minor potholes or impending potholes in the surfacing. The combined distressed area is 2% or less of the deck area.	0 – Do Nothing 1 – Repair potholes 2 – Rehab and/or protect unit
3	Decay, insect infestation, splitting cracking or crushing has produced loss of strength of the element but not of sufficient magnitude to affect the serviceability of the bridge. The combined area of distress is more than 2% but less than 10% of the total deck area.	0 – Do Nothing 3 – Rehab deck and repair or replace surfacing 4 – Replace deck and surfacing
4	Advanced deterioration. Decay, insect infestation, splits, cracks or crushing has produced loss of strength that affects the serviceability of the bridge. The combined area of distress is more than 10% but less than 25% of the total deck area.	0 – Do Nothing 4 – Replace deck and surfacing

### Notes

- ***The entire quantity shall be placed in one condition state***

## Timber Slab Bare (sq. m)

This element defines those slab span bridges that are constructed of timber and are not overlaid.

Condition	Description	Feasible Action
1	Investigation indicates no decay. There may be cracks, splits and checks having no effect on strength or serviceability.	0 – Do Nothing
2	Decay, insect infestation, splitting, cracking or crushing may exist but none is sufficiently advanced to affect serviceability or strength. The combined distressed area is 2% or less of the deck area.	0 – Do Nothing 1 – Rehab and/or protect deck
3	Decay, insect infestation, splitting cracking or crushing has produced loss of strength of the element but not of sufficient magnitude to affect the serviceability of the bridge. The combined area of distress is more than 2% but less than 10% of the total deck area.	0 – Do Nothing 0 – Rehab deck 2 – Replace deck
4	Advanced deterioration. Decay, insect infestation, splits, cracks or crushing has produced loss of strength that affects the serviceability of the bridge.	0 – Do Nothing 2 – Replace deck

### Notes

- ***The entire quantity shall be placed in one condition state***
- ***This element is intended for manufactured glulam slabs***

## Timber Slab – with AC Overlay (sq. m)

55

This element defines those slab span bridges that are constructed of timber and are overlaid with asphaltic concrete.

Condition	Description	Feasible Action
1	Investigation indicates no decay. There may be cracks, splits and checks having no effect on strength or serviceability. There are no potholes in the surfacing.	0 – Do Nothing
2	Decay, insect infestation, splitting, cracking or crushing may exist but none is sufficiently advanced to affect serviceability. There may be minor potholes or impending potholes in the surfacing. The combined distressed area is 2% or less of the deck area.	0 – Do Nothing 1 – Repair potholes 2 – Rehab and/or protect unit
3	Decay, insect infestation, splitting cracking or crushing has produced loss of strength of the element but not of sufficient magnitude to affect the serviceability of the bridge. The combined area of distress is more than 2% but less than 10% of the total deck area.	0 – Do Nothing 3 – Rehab deck and repair or replace surfacing 4 – Replace deck and surfacing
4	Advanced deterioration. Decay, insect infestation, splits, cracks or crushing has produced loss of strength that affects the serviceability of the bridge.	0 – Do Nothing 4 – Replace deck and surfacing

### Notes

- ***The entire quantity shall be placed in one condition state***
- ***This element is intended for use with manufactured glulam slabs***

## Prestressed Concrete Slab Bare (sq. m)

These elements define those concrete bridge decks/slabs with no surface protection of any type and constructed with uncoated reinforcement.

Condition	Description	Feasible Action
1	The surface of the deck has no patched areas and there are no spalls/delaminations in the deck surface.	0 - Do Nothing 1 - Add a protective system
2	Patched areas and/or spalls/delaminations exist in the deck surface. The combined distressed area is 2% or less of the deck area.	0 - Do Nothing 1 - Add a protective system 2 - Repair spalled/delam areas
3	Patched areas and/or spalls/delaminations exist in the deck surface. The combined area of distress is more than 2% but less than 10% of the total deck area.	0 - Do Nothing 2 - Repair spalled areas 3 - Repair spalled areas and add a protective system on entire deck
4	Patched areas and/or spalls/delaminations exist in the deck surface. The combined area of distress is more than 10% but less than 25% of the total deck area.	0 - Do Nothing 2 - Repair spalled areas 3 - Repair spalled areas and add a protective system on entire deck
5	Patched areas and/or spalls/delaminations exist. The combined area of distress is more than 25% of the total deck area.	0 - Do Nothing 3 - Repair spalled areas and add a protective system on entire deck 4 - Replace deck

### Notes

- ***The entire quantity shall be placed in one condition state***
- ***Element numbers 358 and /or 359 should be used in addition to this element if the deck/slab is cracked or if there are deficiencies associated with the soffit.***
- ***Only rate the TOP or WEARING SURFACE, any full depth deterioration is taken care of with the "Soffit or Underside of Deck" Smart Flag (Element 359, page 66).***
- ***Both top and bottom of deck cracking can be tracked as smart flags (Elements 358 and 359).***
- ***Patched areas are repaired areas that are expected to have less durability than the surrounding deck material and are considered temporary. Chipping out and repouring would not be considered a temporary patch.***

## Prestressed Concrete Slab – Unprotected with AC Overlay (sq. m)

61

These elements define those concrete bridge decks/slabs with no surface protection of any type. The deck is covered with an asphaltic concrete overlay.

Condition	Description	Feasible Action
1	The surfacing on the deck has no patched areas and there are no potholes in this surfacing.	0 – Do Nothing
2	Patched areas and/or potholes or impending potholes exist. Their combined area is less than 2% the total deck area.	0 – Do Nothing 1 – Repair potholes and substrate
3	Patched areas and/or potholes or impending potholes exist. Their combined area is more than 2% but less than 10% of the total deck area.	0 – Do Nothing 1 – Repair potholes and substrate 2 – Replace overlay and repair substrate
4	Patched areas and/or potholes or impending potholes exist. Their combined area is more than 10% but less than 25% of the total deck area.	0 – Do Nothing 2 – Replace overlay and repair substrate 3 – Repair substrate, replace overlay and protective system
5	Patched areas and/or potholes or impending potholes exist. Their combined area is more than 25% of the total deck area.	0 – Do Nothing 2 – Replace overlay and repair substrate 4 – Replace deck

### Notes

- ***The entire quantity shall be placed in one condition state***
- ***Element number 359 can be used to track cracking associated with the soffit.***
- ***Patched areas are repaired areas that are expected to have less durability than the surrounding deck material and are considered temporary. Chipping out and repouring would not be considered a temporary patch.***

## Cable (Not Embedded in Concrete) (EA)

This element defines only those steel cables not embedded in concrete.

Condition	Description	Feasible Action
1	There is little or no corrosion of unpainted steel. Paint system, if present, is sound and functioning as intended to protect the metal surface. Strand and anchor sockets show no signs of distress.	0 – Do Nothing
2	Surface rust has formed or is forming. Paint system, if present, is peeling and is no longer effective. Strand and anchor sockets show no signs of distress.	0 – Do Nothing 1 – Clean and paint
3	The paint system, if present, has failed. Surface pitting may be present but any section loss is incidental and does not affect the strength or serviceability of either the element or the bridge. Cable banding, if any, may show some loosening or slipping. Cable anchor devices may be loosening.	0 – Do Nothing 1 – Clean and paint
4	Corrosion is advanced. Cable strands or wires may be broken or severely abraded. Anchors may show signs of slippage. Section loss or other deterioration is sufficient to warrant analysis for strength and/or serviceability of both the element and the bridge.	0 – Do Nothing 2 – Rehab unit and replace paint system 3 – Replace unit

### Notes

- ***Count each catenary cable and each main suspension cable or cable stay.***
- ***This element should not be used for earthquake restrainer cables***
- ***This element should be used for steel girder post-tensioning cables***

## Steel Pin and Hanger Assembly, Unpainted (EA)

160

This element defines only those steel pin and hanger assemblies that are either not painted or are constructed of weathering steel.

Condition	Description	Feasible Action
1	There is little or no corrosion of the unpainted steel. The weathering steel is coating uniformly and remains in excellent condition.	0 - Do Nothing
2	Surface rust, surface pitting, has formed or is forming on the unpainted steel. The weathering steel has not corroded beyond design limits.	0 - Do Nothing 1 - Clean and paint 2 - Rehab element
3	Steel has measurable section loss due to corrosion but does not warrant structural analysis.	0 - Do Nothing 2 - Rehab element
4	Corrosion is advanced. Section loss is sufficient to warrant structural analysis to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.	0 - Do Nothing 2 - Rehab element 3 - Replace unit

### Notes

- ***Indications found using ultrasonic testing would typically place the assembly in Condition State 4.***

## Steel Pin and Hanger Assembly, Painted (EA)

This element defines only those steel pin and hanger assemblies that are painted.

Condition	Description	Feasible Action
1	There is no evidence of active corrosion and the paint system is sound and functioning as intended to protect the metal surface.	0 – Do Nothing
2	There is little or no active corrosion. The paint system may be chalking, peeling, curling or showing other early evidence of paint system distress but there is no exposure of metal.	0 – Do Nothing 1 – Surface clean
3	Surface or freckled rust has formed or is forming. The paint system is no longer effective. There may be exposed metal but there is no loss of section.	0 – Do Nothing 2 – Spot blast, clean and paint
4	The paint system has failed. Surface pitting may be present but any section loss due to active corrosion does not yet warrant structural analysis of either the element or the bridge.	0 – Do Nothing 3 – Replace paint system 4 – Repair/replace paint system
5	Corrosion is advanced. Section loss is sufficient to warrant analysis to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.	0 – Do Nothing 5 – Major rehab unit 6 – Replace unit

### Notes

- ***Indications found using ultrasonic testing would typically place the assembly in Condition State 5.***



# Railroad Car Frame (EA)

170

This element is intended to be used for all superstructures composed of railroad car frames. The entire superstructure area (equivalent deck area) that consists of railroad cars, whether it is one span or multiple spans will be treated as an “each”.

Condition	Description	Feasible Action
1	There is no evidence of corrosion and any paint systems are sound and functioning as intended to protect the metal surface.	0 – Do Nothing
2	There is corrosion. Paint systems, if present, may be showing signs of distress. The total superstructure area in this state of distress is less than 10% of the total superstructure area.	0 – Do Nothing 1 – Surface clean and restore top coat of paint
3	There is corrosion. Paint systems, if present, may be showing signs of distress. The total superstructure area in this state of distress is more than 10% but less than 25% of the total superstructure area.	0 – Do Nothing 1 – Surface clean and restore top coat of paint
4	There is corrosion. Paint systems, if present, may be showing signs of distress. The total superstructure area in this state of distress is more than 25% of the total superstructure area.	0 – Do Nothing 1 – Surface clean and restore top coat of paint
5	Corrosion is advanced. Section loss in any portion of the element is sufficient to warrant analysis to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.	0 – Do Nothing 2 – Replace unit

## Miscellaneous Steel Superstructures (EA)

This element is intended to be used for all other miscellaneous steel superstructure elements that were not previously defined. Example of such structures are army steel treadway, boat hatch cover, army steel pontoon, etc. The entire superstructure area (equivalent deck area) composed of these miscellaneous elements will be treated as an each regardless of the number of spans.

Condition	Description	Feasible Action
1	There is no evidence of corrosion and any paint systems are sound and functioning as intended to protect the metal surface.	0 – Do Nothing
2	There is corrosion. Paint systems, if present, may be showing signs of distress. The total superstructure area in this state of distress is less than 10% of the total superstructure area.	0 – Do Nothing 1 – Surface clean and restore top coat of paint
3	There is corrosion. Paint systems, if present, may be showing signs of distress. The total superstructure area in this state of distress is more than 10% but less than 25% of the total superstructure area.	0 – Do Nothing 1 – Surface clean and restore top coat of paint
4	There is corrosion. Paint systems, if present, may be showing signs of distress. The total superstructure area in this state of distress is more than 25% of the total superstructure area.	0 – Do Nothing 1 – Surface clean and restore top coat of paint
5	Corrosion is advanced. Section loss in any portion of the element is sufficient to warrant analysis to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.	0 – Do Nothing 2 – Replace unit

# Steel Culvert (m)

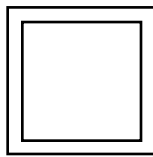
240

This element defines all metal (steel, aluminum, galvanized) culverts, including arches, round or elliptical pipes, etc.

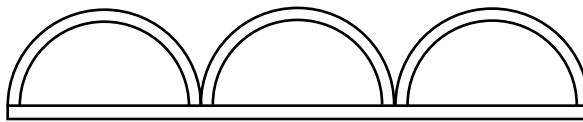
Condition	Description	Feasible Action
1	The element shows little or no deterioration. Some discoloration or surface corrosion may exist but there is no metal pitting.	0 - Do Nothing
2	There may be minor to moderate corrosion and pitting, especially at the barrel invert. Little or no distortion exists.	0 - Do Nothing 1 - Rehab unit
3	Significant corrosion, deep pitting or some holes in the invert may exist. Significant scour or erosion may be affecting structural integrity. Minor to moderate distortion and deflection may exist.	0 - Do Nothing 1 - Rehab unit
4	Major corrosion, extreme pitting or holes in the barrel may exist. Major distortion, deflection, or settlement may be evident.	0 - Do Nothing 1 - Rehab unit 2 - Replace unit

## Notes

- ***This element includes galvanized metal culverts***
- ***Measurements are along the barrel length.***
- ***Culverts. The quantity for culverts will be the length of the barrel regardless of the number of individual barrels. For example if you have a 3 barrel culvert that is 75 meters long the total length of the culvert is  $(75\text{ m}) \times (1) = 75\text{ meters}$***



Quantity = 1 × Barrel Length



Quantity = 1 × Barrel Length

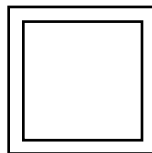
## Reinforced Concrete Culvert (m)

This element defines all precast and cast-in-place (conventional or prestressed) concrete arch, pipe and box culverts.

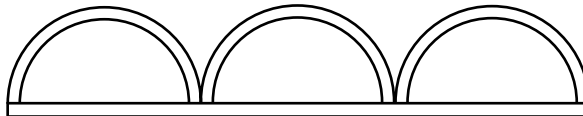
Condition	Description	Feasible Action
1	Superficial cracks and spalls may be present, but there is no exposed reinforcing or evidence of rebar corrosion. There is little or no deterioration or separation of joints.	0 - Do Nothing
2	Deterioration, minor chloride contamination, minor cracking and/or leaching may have begun. There may be deterioration and separation of joints.	0 - Do Nothing 1 - Rehab unit
3	There may be moderate to major deterioration, extensive cracking and/or leaching and large areas of spalls. Minor to moderate distortion, settlement, or misalignment may have occurred. There may be considerable deterioration and separation of joints.	0 - Do Nothing 1 - Rehab unit
4	Major deterioration, spalling, cracking, major distortion, deflection settlement, or misalignment of the barrel may be in evidence. Major separation of joints may have occurred. Holes may exist in floors and walls.	0 - Do Nothing 1 - Rehab unit 2 - Replace unit

### Notes

- **Measurements are along the barrel length.**
- **Culverts.** *The quantity for culverts will be the length of the barrel regardless of the number of individual barrels. For example if you have a 3 barrel culvert that is 75 meters long the total length of the culvert is  $(75\text{ m}) \times (1) = 75\text{ meters}$*



Quantity = 1 × Barrel Length



Quantity = 1 × Barrel Length

# Timber Culvert (m)

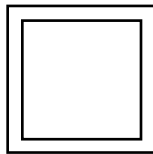
242

This element defines all timber box culverts.

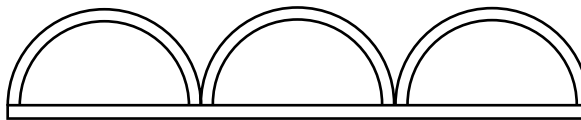
Condition	Description	Feasible Action
1	The timber and fasteners are in sound condition.	0 - Do Nothing
2	There may be minor decay and weathering. Corrosion at fasteners and connections may have begun. There is little or no distortion and/or deflection.	0 - Do Nothing 1 - Rehab unit
3	There may be significant decay, weathering and warped or broken timbers. Significant decay and corrosion at fasteners and connections may be evident. Minor to moderate distortion of the culvert may exist.	0 - Do Nothing 1 - Rehab unit
4	There may be major decay and many warped, broken or missing timbers. There is major decay and corrosion at fasteners and connections. Major distortion or deflection of the culvert may exist.	0 - Do Nothing 1 - Rehab unit 2 - Replace unit

## Notes

- **Measurements are along the barrel length.**
- **Culverts.** *The quantity for culverts will be the length of the barrel regardless of the number of individual barrels. For example if you have a 3 barrel culvert that is 75 meters long the total length of the culvert is  $(75\text{ m}) \times (1) = 75\text{ meters}$*



Quantity = 1 × Barrel Length



Quantity = 1 × Barrel Length

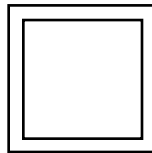
## Other Culvert (m)

This element defines all culverts not included under steel, concrete or timber culverts. It will include masonry and combinations of other materials.

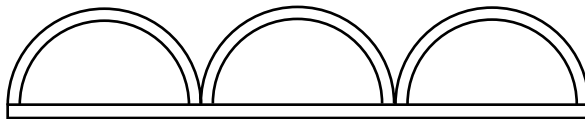
Condition	Description	Feasible Action
1	There is little or no deterioration. Surface defects only are in evidence. There are no scour or misalignment problems.	0 - Do Nothing
2	There may be minor deterioration, cracking and misalignment.	0 - Do Nothing 1 - Rehab unit
3	Moderate to major deterioration and cracking and/or minor to moderate distortion or deflection has occurred.	0 - Do Nothing 1 - Rehab unit
4	Major distortion, deflection, settlement or misalignment and/or major deterioration affecting structural integrity may have occurred.	0 - Do Nothing 1 - Rehab unit 2 - Replace unit

## Notes

- ***This element includes masonry and prestressed concrete culverts***
- ***Measurements are along the barrel length.***
- ***Culverts. The quantity for culverts will be the length of the barrel regardless of the number of individual barrels. For example if you have a 3 barrel culvert that is 75 meters long the total length of the culvert is  $(75\text{ m}) \times (1) = 75\text{ meters}$***



Quantity = 1 × Barrel Length



Quantity = 1 × Barrel Length

# Tunnel (m)

250

This element defines all types and shapes of tunnels, whether they are bored or cut-and-cover.

Condition	Description	Feasible Action
1	The element shows little or no signs of deterioration. There may be minor cracking, corrosion and/or other minor deterioration having no effect on strength or serviceability.	0 – Do Nothing
2	Minor cracking, spalls, or corrosion may be present and should be repaired to prevent further deterioration that could jeopardize the structural integrity of the element.	0 – Do Nothing 1 – Rehab unit
3	Advanced deterioration. Corrosion or loss of section is sufficient to warrant analysis to ascertain the impact on the serviceability or strength of the element.	0 – Do Nothing 1 – Rehab unit 2 – Replace unit

## Notes

- ***This element should be used for box culverts not designed to carry water.***
- ***Measurements are along the tunnel length.***

## Steel Shell Foundation Pile Filled with Concrete (EA)

This element is intended to be used for pile extensions. Use element 254 or 255 for seismic steel column jackets.

Condition	Description	Feasible Action
1	There is no evidence of corrosion and the paint system is sound and functioning as intended to protect the metal surface.	0 - Do Nothing 1 - Surface clean unit
2	There is little or no corrosion. The paint system may be chalking, peeling, curling or showing other early evidence of paint system distress but there is no exposure of metal.	0 - Do Nothing 1 - Surface clean 2 - Surface clean and restore top coat
3	Surface or freckled rust has formed or is forming. The paint system is no longer effective. There may be exposed metal but there is no loss of section.	0 - Do Nothing 3 - Spot blast, clean and paint
4	The paint system has failed. Surface pitting may be present but any section loss is incidental and does not yet affect the strength or serviceability of either the element or the bridge. Small seam weld cracks may be present but are less than 12 mm in length.	0 - Do Nothing 3 - Spot blast, clean and paint 4 - Replace paint system
5	Corrosion is advanced. Section loss is sufficient to warrant analysis to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge.	0 - Do Nothing 5 - Rehab and replace paint system 6 - Replace unit

### Notes

- ***This element should be used for Raymond step taper piles***
- ***Piles that are completely submerged, in soil or water, and not visible for inspection, should typically be recorded as quantity 1 EA in condition state 1. If the foundation piles are partially visible for inspection, record the actual number of inspected piles and the corresponding condition states***



CIDH (EA)  
Other (EA)

252  
253

The Inspecting Engineer is not required to rate the foundation piles of a bridge. There are no condition state descriptions or any feasible actions associated with the foundation piles.

Piles that are completely submerged, in soil or water, and not visible for inspection, should typically be recorded as quantity 1 EA in condition state 1. If the foundation piles are partially visible for inspection, record the actual number of inspected piles and the corresponding condition states.

## Steel Seismic Column Shells (Full Height) (EA)

Condition	Description	Feasible Action
1	There is no evidence of active corrosion and the paint system is sound and functioning as intended to protect the metal surface.	0 – Do Nothing 1 – Surface clean
2	There is little or no active corrosion. The paint system may be chalking, peeling, curling or showing other early evidence of paint system distress but there is no exposure of metal. All welds are intact.	0 – Do Nothing 1 – Surface clean 2 – Surface clean and restore top coat
3	Surface or freckled rust has formed or is forming. The paint system is no longer effective. There may be exposed metal but there is no active corrosion which is causing loss of section. Seam welds are intact.	0 – Do Nothing 3 – Spot blast, clean and paint
4	The paint system has failed. Surface pitting may be present but any section loss is due to active corrosion does not yet warrant structural analysis of either the element or the bridge. Small seam weld cracks may be present but are less than 12 mm in length.	0 – Do Nothing 3 – Spot blast, clean and paint 4 – Replace paint system
5	Corrosion has caused section loss and is sufficient to warrant analysis to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge. Seam weld cracks exceed 12 mm.	0 – Do Nothing 5 – Major rehab unit 6 – Replace unit

### Notes

- ***Columns with full height shells will not use an associated column element 204, 205, 210 or 211.***

## Steel Seismic Column Shells (Partial Height) (EA)

255

Condition	Description	Feasible Action
1	There is no evidence of active corrosion and the paint system is sound and functioning as intended to protect the metal surface.	0 - Do Nothing 1 - Surface clean
2	There is little or no active corrosion. The paint system may be chalking, peeling, curling or showing other early evidence of paint system distress but there is no exposure of metal. All welds are intact.	0 - Do Nothing 1 - Surface clean 2 - Surface clean and restore top coat
3	Surface or freckled rust has formed or is forming. The paint system is no longer effective. There may be exposed metal but there is no active corrosion which is causing loss of section. Seam welds are intact.	0 - Do Nothing 3 - Spot blast, clean and paint
4	The paint system has failed. Surface pitting may be present but any section loss is due to active corrosion does not yet warrant structural analysis of either the element or the bridge. Small seam weld cracks may be present but are less than 12 mm in length.	0 - Do Nothing 3 - Spot blast, clean and paint 4 - Replace paint system
5	Corrosion has caused section loss and is sufficient to warrant analysis to ascertain the impact on the ultimate strength and/or serviceability of either the element or the bridge. Seam weld cracks exceed 12 mm.	0 - Do Nothing 5 - Major rehab unit 6 - Replace unit

### Notes

- **Record the condition state of the visible portion of the column as the appropriate column element (204, 205, 210 or 211) in addition to the partial shell element.**

## Slope Protection (EA)

This element identifies all types of slope protection under the bridge; including grouted or ungrouted riprap and concrete which provides erosion protection under the bridge.

Condition	Description	Feasible Action
1	Little or no deterioration of the concrete or breakdown of the asphalt aggregate surfacing. No undermining of slabs. The erosion control system is functioning properly.	0 – Do Nothing
2	Some undermining of concrete slabs, some areas of concrete spalling or minor amounts of erosion and breakdown of aggregate and asphalt surfacing. The erosion control system is marginally effective.	0 – Do Nothing 1 – Repair protection
3	Major undermining of slabs, major erosion areas, concrete broken up or with major spalls. The effectiveness of the erosion control system is highly questionable.	0 – Do Nothing 2 – Rehab unit 3 – Replace unit

### Notes

- ***Record the one each for each location protected.***
- ***This element is not for use with continuously lined channels***

## Strip Seal Expansion Joint (m)

300

This element defines only those expansion joint devices which utilize a neoprene type waterproof gland with steel extrusion to anchor the gland.

Condition	Description	Feasible Action
1	There is no leakage at any point along the joint. Gland is secure and has no defects. Debris in joint is not causing any problems.	0 – Do Nothing
2	Minor leakage due to punctured or ripped joint, or due to gland pulled out of extrusion. Significant debris in joint.	0 – Do Nothing 1 – Patch/reset/clean joint
3	Major deterioration of gland, concrete spalled at joint, major leakage along entire joint.	0 – Do Nothing 2 – Replace gland and patch concrete 3 – Replace joint

### Notes

- ***Approach slab expansion joints are included in this element.***
- ***See Appendix 2 to account for “skew”.***

## Pourable Joint Seal (m)

This element defines only those joints filled with a pourable seal.

Condition	Description	Feasible Action
1	The element shows minimal deterioration. Adhesion is sound with no signs of leakage. There are no cohesion cracks. The adjacent deck and/or header is sound.	0 – Do Nothing
2	Minor adhesion and/or cohesion failures may be present. Minor leakage may show underneath. Joint may be slightly impacted with debris. Minor spalls in deck and/or headers may be present adjacent to joint.	0 – Do Nothing 1 – Clean joint and replace seal
3	Adhesion and/or cohesion failures are large enough to cause leakage problems. Joint may be heavily impacted with debris and/or stones. Adjacent deck may be spalled.	0 – Do Nothing 2 – Clean joint, patch spalls, replace seals

### Notes

- ***Approach slab expansion joints are included in this element.***
- ***See Appendix 2 to account for “skew”.***

## Compression Joint Seal (m)

302

This element defines only those joints filled with a pre-formed compression type seal.

Condition	Description	Feasible Action
1	The element shows minimal deterioration. Adhesion is sound with no signs of leakage. There are no cohesion cracks. The adjacent deck and/or header is sound.	0 – Do Nothing
2	There may be small adhesion failures. The seal may show signs of abrasion or minor tearing. Minor spalls in the deck and/or headers may be present.	0 – Do Nothing 1 – Remove and reinstall seal
3	Adhesion failures may be prevalent with the seal possibly showing signs of failure from abrasion or tearing. Significant spalls may be present in the deck and/or headers adjacent to the seal.	0 – Do Nothing 2 – Replace seal and/or patch spalls

### Notes

- ***Approach slab expansion joints are included in this element.***
- ***See Appendix 2 to account for “skew”.***

303  
341  
342  
343  
344  
345  
346  
347

## Assembly Joint/Seal (m)

This element defines only those joints filled with an assembly mechanism that may or may not have a seal.

Condition	Description	Feasible Action
1	The element shows minimal deterioration. The anchors are tight. There are no broken welds or fingers. The adjacent deck is sound. The paint system, if it is present, is sound and functioning as intended to protect the metal.	0 – Do Nothing
2	The paint system, if present, may show some corrosion with slight pitting. There may be minor weld cracking. The adjacent deck may show signs of loosening. There may be minor spalling of the anchorage concrete.	0 – Do Nothing 1 – Rehab Unit
3	Corrosion is advanced. The assembly may be loose because of anchorage failure. There may be deck spalling adjacent to the assembly. Broken fingers may be prevalent.	0 – Do Nothing 1 – Rehab Unit 2 – Replace Unit

### Notes

- ***Evidences of mechanical failure such as loose or broken springs, bolts, or support bars shall be coded as Condition State 3.***
- ***Approach Slab expansion joints are included in this element.***
- ***Delaminations and fractures should be treated similar to spalling***
- ***Seal leakage should be recorded in Condition State 2 or 3 as appropriate***

### Element Determination

Element Number	Description
303	Assembly Joint/Seal (Modular)
341	Steel Finger (Sealed)
342	Joint – Waboflex
343	Joint – Wabo Aluminum Strip
344	Joint – Delastiflex RV
345	Joint – Delastiflex DL
346	Joint – Aluminum
347	Joint – Mauer



## Open Expansion Joint (m)

304  
349  
350

This element defines only those joints that are open and not sealed.

Condition	Description	Feasible Action
1	The element shows minimal deterioration. Joint armor, if present, is secure. There are no significant joint spalls.	0 – Do Nothing
2	There may be deck cracking indicating armor anchor loosening. Spalling at joint edges or adjacent to armor may have begun. There may be corrosion on joint armor.	0 – Do Nothing 1 – Rehab unit
3	Advanced corrosion of joint armor. There may be large spalls at the joint edges or adjacent to armor. Armor anchors are loose.	0 – Do Nothing 1 – Rehab unit 2 – Replace unit

### Element Determination

Element Number	Description
304	Open Expansion Joint
349	Open Joint – Steel Sliding Plates
350	Open Joint – Steel Finger (Not Sealed)

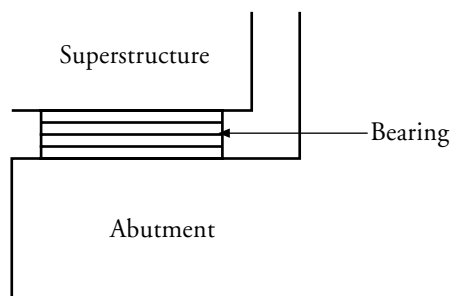
## Elastomeric Bearing (EA)

This element defines only those bridge bearings that are constructed primarily of elastomers, with or without fabric or metal reinforcement.

Condition	Description	Feasible Action
1	The element shows little or no deterioration. Shear deformations are correct for existing temperatures. *(The vertical slope is 0 – 30 degrees.)	0 – Do Nothing
2	Minor cracking, splitting or other deterioration may be present. Shear deformation may be slightly excessive. Strength and/or serviceability are not affected. *(The vertical slope is 30 – 45 degrees.)	0 – Do Nothing 1 – Reset bearings
3	Advanced deterioration. Shear deformations may be excessive. Top and bottom surfaces may no longer be parallel. Loss of bearing may be imminent. *(The vertical slope is greater than 45 degrees.)	0 – Do Nothing 1 – Reset bearings 2 – Replace unit and reset girders

### Notes

- ***Typical elastomeric pad at an Abutment***



## Moveable Bearing (Roller, Sliding, etc.) (EA)

311

This element defines only those bridge bearings which provide for both rotation and longitudinal movement by means of roller, rocker, or sliding mechanisms.

Condition	Description	Feasible Action
1	The element shows little or no deterioration. If a paint system is present, it is sound and functioning as intended to protect the metal. The bearing has minimal debris and corrosion. Vertical and horizontal alignment is within limits. Bearing support member is sound. Any lubrication system is functioning properly.	0 - Do Nothing
2	The paint system, if present, may show some corrosion with minor pitting. The assemblies may have moved enough to cause minor cracking in the supporting concrete. Debris buildup is affecting bearing movement. Bearing alignment is still tolerable.	0 - Do Nothing 1 - Rehab supports and/or reset bearing devices
3	Corrosion is advanced. There may be loss of section of the supporting member sufficient to warrant supplemental supports or load restrictions. Bearing alignment may be beyond tolerable limits. Shear keys may have failed. The lubrication system, if any, may have failed.	0 - Do Nothing 2 - Rehab supports 3 - Replace unit

## Enclosed/Concealed Bearing or Bearing System (EA)

This element defines only those bridge bearings that are enclosed so that they are not open for detailed inspection.

Condition	Description	Feasible Action
1	The element shows little or no deterioration. There are no vertical or horizontal offsets. There is no cracking of support members. The supported member is stable under traffic.	0 – Do Nothing
2	Both vertical and horizontal offsets are within the capability of the bearings and are not yet significant. The supported member may exhibit minimal vertical movement under traffic. Cracking of support members is not yet significant. There may be insignificant reduction of bearing due to superstructure shortening.	0 – Do Nothing 1 – Rehab unit
3	Vertical and/or horizontal offsets are significant indicating bearing failures. There may be significant vertical movement under traffic. Cracking of the support members may be significant. There may be significant reduction of bearing due to superstructure shortening.	0 – Do Nothing 1 – Rehab unit 2 – Replace unit

### Notes

- ***This element should be used for the typical box girder hinge.***
- ***Record each bearing system consisting of the entire bridge width from end diaphragm to end diaphragm.***

# Fixed Bearing (EA)

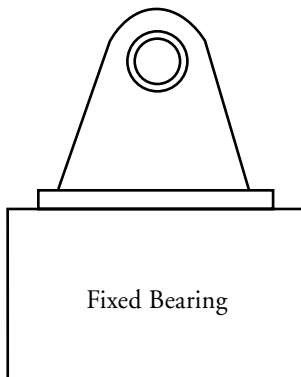
313

This element defines only those bridge bearings that provide for rotation only.

Condition	Description	Feasible Action
1	The element shows little or no deterioration. If a paint system is present, it is sound and functioning as intended to protect the metal. Vertical and horizontal alignment is within limits. Bearing support member is sound. Any lubrication system is functioning properly.	0 - Do Nothing
2	The paint system, if present, may show some corrosion with minor pitting. The assemblies may have moved enough to cause minor cracking in the supporting concrete.	0 - Do Nothing 1 - Clean and paint or reset bearings and/or rehab supports
3	Corrosion is advanced. There may be loss of section of the supporting member sufficient to warrant supplemental supports or load restrictions. Shear Keys may have failed. The lubrication system, if any, may have failed.	0 - Do Nothing 1 - Rehab supports or bearings 2 - Replace unit

## Notes

- ***Typical fixed bearing***



## Pot Bearing (EA)

This element defines those high load bearings with confined elastomer. The bearing may be fixed against horizontal movement, guided to allow movement in one direction, or floating to allow sliding in any direction.

Condition	Description	Feasible Action
1	The element shows minimal deterioration. The paint or other anti-corrosion system is sound and functioning as intended to protect the metal. The bearing has minimal debris and corrosion. Vertical and horizontal alignment is within limits. Bearing support member is sound. Any lubrication system is functioning properly.	0 – Do Nothing
2	The anti-corrosion system may show some corrosion with minor pitting. Debris buildup is affecting bearing movement. Bearing alignment and load carrying capacity is still tolerable.	0 – Do Nothing 1 – Rehab supports or bearing devices
3	Corrosion is advanced. Bearing alignment and load carrying capacity may be beyond limits. Shear keys and the lubrication system, if any, may have failed. Elastomer may be actively extruding from the device.	0 – Do Nothing 2 – Rehab bearing devices 3 – Replace unit

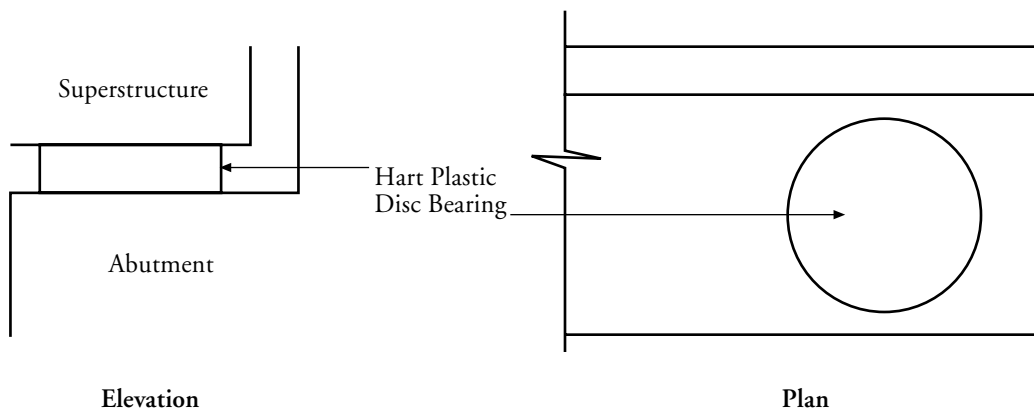
# Disk Bearing (EA)

315

This element defines those high load bearings with a hard plastic disk. The bearing may be fixed against horizontal movement, guided to allow movement in one direction, or floating to allow sliding in any direction.

Condition	Description	Feasible Action
1	The element shows minimal deterioration. The paint or other anti-corrosion system is sound and functioning as intended to protect the metal. The bearing has minimal debris and corrosion. Vertical and horizontal alignment is within limits. Bearing support member is sound. Any lubrication system is functioning properly.	0 - Do Nothing
2	The anti-corrosion system may show some corrosion with minor pitting. Debris buildup is affecting bearing movement. Bearing alignment and load carrying capacity is still tolerable.	0 - Do Nothing 1 - Rehab supports or bearing devices
3	Corrosion is advanced. Bearing alignment and load carrying capacity may be beyond limits. Shear keys and the lubrication system, if any, may have failed.	0 - Do Nothing 2 - Rehab bearing devices 3 - Replace unit

## Notes



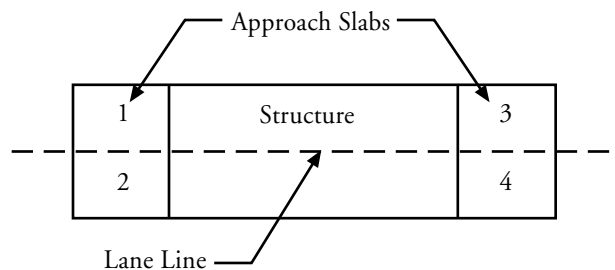
## Prestressed Concrete Approach Slab (EA)

This element defines those structural sections between the abutment and the approach pavement that are constructed of prestressed concrete.

Condition	Description	Feasible Action
1	The slab has not settled and shows no sign of deterioration other than superficial surface cracks.	0 - Do Nothing
2	Minor cracking, spalls may be present but they do not affect the ability of the slab to carry traffic. Settlement may be occurring which increases the traffic impact on the bridge.	0 - Do Nothing 1 - Perform mudjacking operations
3	Cracks may extend completely through the slab cross-section, but the slab does not act as if it is broken. Spalls may be heavy but they do not affect the structural integrity of the slab. Settlement may be occurring which increases the traffic impact on the bridge.	0 - Do Nothing 2 - Place overlay 3 - Replace unit
4	The slab is broken or rocks under traffic loads. Settlement is excessive and cannot be corrected without increasing the size of the slab.	0 - Do Nothing 3 - Replace unit

### Notes

- ***The example below shows four approach slab units to be recorded.***





# Reinforced Concrete Approach Slab (EA)

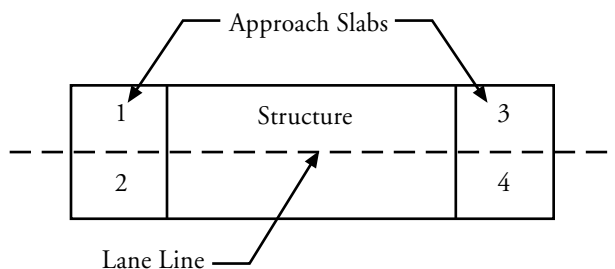
321

This element defines those structural sections between the abutment and the approach pavement that are constructed of reinforced concrete.

Condition	Description	Feasible Action
1	The slab has not settled and shows no sign of deterioration other than superficial surface cracks.	0 - Do Nothing
2	Minor cracking, spalls may be present but they do not affect the ability of the slab to carry traffic. Settlement may be occurring which increases the traffic impact on the bridge.	0 - Do Nothing 1 - Perform mudjacking operations
3	Cracks may extend completely through the slab cross-section, but the slab does not act as if it is broken. Spalls may be heavy but they do not affect the structural integrity of the slab. Settlement may be occurring which increases the traffic impact on the bridge.	0 - Do Nothing 2 - Place overlay 3 - Replace unit
4	The slab is broken or rocks under traffic loads. Settlement is excessive and cannot be corrected without increasing the size of the slab.	0 - Do Nothing 3 - Replace unit

## Notes

- The example below shows four approach slab units to be recorded.**



330  
336  
337  
338

## Metal Bridge Railing (m)

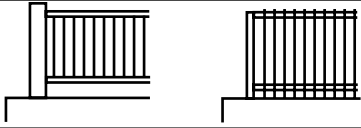
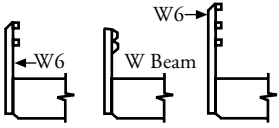
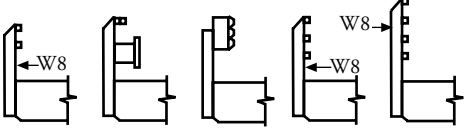
This element defines all types and shapes of metal bridge railing. Steel, metal beam and rolled shapes. The element may be either painted, galvanized, or unpainted. See Appendix, page A-6 for length conventions.

Condition	Description	Feasible Action
1	There is little or no corrosion of the unpainted metal. If a protective coating is present it is sound and functioning as intended to protect the element.	0 – Do Nothing
2	Surface or freckled rust has formed or is forming on the unpainted metal. If a protective coating is present it has minor areas of deterioration.	0 – Do Nothing 1 – Clean and paint
3	Any protective coating present has failed. Surface pitting may be present but any section loss due to active corrosion is measurable and does not affect the strength or serviceability of the element.	0 – Do Nothing 1 – Clean and paint
4	Corrosion is advanced. Section loss is sufficient to warrant analysis to ascertain the impact on the ultimate strength and/or serviceability of the element.	0 – Do Nothing 2 – Rehab unit 3 – Replace unit

### Notes

- ***If the serviceability of the rail is affected by damaged posts or unsupported rail, code as Condition State 4. Record the lineal meters of rail affected by the defective or missing post(s).***
- ***Combination rails are coded as Element No. 333, 334 or 335***

### Element Determination

Element Number	Description
330	Includes all rails constructed of 100% steel (excluding sidewalk) and not depicted below
336	Steel Rail (pipe/picket) Includes all vertical pipe and picket rails constructed of <i>only</i> steel. 
337	Steel Rail (W6). Includes the rails shown. The rail must be steel with W6 posts. 
338	Steel Rail (W8). Includes the 100% steel rails shown. The rail must be all steel with W8 or larger posts. 

# Concrete Bridge Railing (m)

331  
339

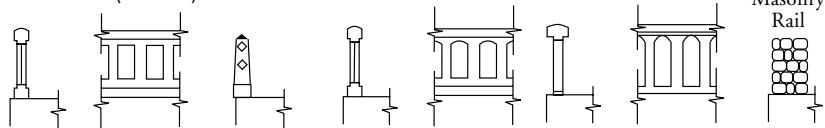
This element defines all types and shapes of reinforced concrete bridge railing. All elements of the railing must be concrete. Include median rail quantities ( see Appendix, page A-6 for conventions).

Condition	Description	Feasible Action
1	The element shows little or no deterioration. There may be discoloration, efflorescence, and/or superficial cracking but without effect on strength and/or serviceability.	0 – Do Nothing
2	Minor cracks, surface scaling, or spalls may be present, but there is no exposed reinforcing or surface evidence of rebar corrosion.	0 – Do Nothing 1 – Seal cracks and patch
3	Some delaminations and/or spalls may be present, and some reinforcing may be exposed. Corrosion of rebar may be present, but loss of section is incidental and does not significantly affect the strength and/or serviceability of either the element or the bridge.	0 – Do Nothing 2 – Clean rebar and patch
4	Deterioration is advanced. Corrosion of reinforcement and/or loss of concrete section is sufficient to warrant analysis to ascertain the impact on the strength and/or serviceability of either the element or the bridge.	0 – Do Nothing 3 – Rehab unit 4 – Replace unit

## Notes

- ***If the serviceability of the rail is affected by damaged posts or unsupported rail, code as Condition State 3. Record the lineal meters of rail affected by the defective or missing post(s). Rails with any combination of metal and concrete should be recorded as element 333, 334 or 335.***

## Element Determination

Element Number	Description
331	Concrete Rail – Includes all other, <i>all</i> concrete rails not shown above. All of our modern safety shape rails should be recorded as element 331.
339	Concrete Rail (Aesthetic) 

## Timber Bridge Railing (m)

This element defines all types and shapes of timber bridge railing.

Condition	Description	Feasible Action
1	There is no decay. There may be minor cracks, splits and/or checks.	0 – Do Nothing
2	There may be decay with or without splitting, cracking, checking or crushing but none is sufficiently advanced to affect serviceability.	0 – Do Nothing 1 – Rehab and/or apply surface treatment
3	Advanced deterioration. Decay, splits, cracks or crushing has produced loss of strength that may affect the serviceability of the element.	0 – Do Nothing 2 – Replace unit

### Notes

- ***If the serviceability of the rail is affected by damaged posts or unsupported rail, code as Condition State 3. Record the lineal meters of rail affected by the defective or missing post(s).***
- ***Combination rails are coded as Element No. 333.***

## Miscellaneous Bridge Railing (m)

333  
334  
335

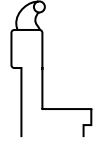
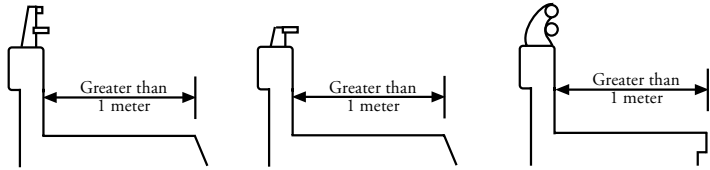
This element defines all types and shapes of bridge railing except those defined as metal, concrete or timber. This element includes combinations of materials.

Condition	Description	Feasible Action
1	The element shows no signs of deterioration. There may be minor cracking, corrosion and/or other minor deterioration having no affect on strength or serviceability.	0 - Do Nothing
2	Minor cracking, spalls, decay of timber portions or corrosion of metal may be present.	0 - Do Nothing 1 - Rehab unit
3	Advanced deterioration. Corrosion, decay or loss of section is sufficient to warrant analysis to ascertain the impact on the serviceability or strength of the element.	0 - Do Nothing 1 - Rehab unit 2 - Replace unit

### Notes

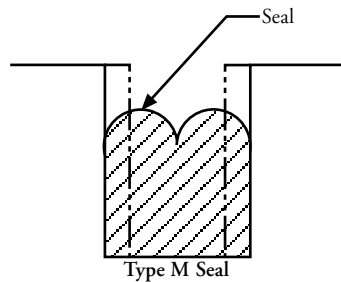
- ***If the serviceability of the rail is affected by damaged posts or unsupported rail, code as Condition State 3. Record the lineal meters of rail affected by the defective or missing post(s).***

### Element Determination

Element Number	Description
333	Includes all rails constructed of a combination of materials and not depicted below.
334	Miscellaneous Rail (1 meter sidewalk) Includes all miscellaneous rails having a sidewalk 1 meter or less in width. 
335	Miscellaneous Rail (sidewalk) includes all miscellaneous rails having a 1 meter or greater sidewalk width. 

## Type M Joint Seal (m)

Condition	Description	Feasible Action
1	The element shows minimal deterioration. Adhesion is sound with no signs of leakage. There are no cohesion cracks. The adjacent deck and/or header is sound.	0 – Do Nothing
2	There may be small adhesion failures. The seal may show signs of abrasion or minor tearing. Minor spalls in the deck and/or headers may be present.	0 – Do Nothing 1 – Remove and reinstall seal
3	Adhesion failures may be prevalent with the seal possibly showing signs of failure from abrasion or tearing. Significant spalls may be present in the deck and/or headers adjacent to the seal.	0 – Do Nothing 2 – Replace seal and/or patch spalls



## Steel Fatigue Smart Flag (EA)

356

This element exists only on those bridges with steel elements which are already showing fatigue damage. It should not be applied to steel bridges prior to fatigue damage becoming apparent.

Condition	Description
1	Fatigue damage to the bridge has been repaired or arrested. The bridge may still be fatigue prone.
2	Fatigue damage exists which is not arrested (normally, this condition state would be used the first time the element is identified and at any other time when additional fatigue damage occurs.)
3	Fatigue damage exists which warrants analysis of the element to ascertain the serviceability of the element or the bridge.

### Notes

- ***This Smart Flag represents all the steel on a bridge. The quantity will always be one (1). Do not count each fatigue crack individually.***

## Pack Rust Smart Flag (EA)

This element defines only those connections (including shapes in contact in built-up members) of steel bridges which are already showing signs of rust packing between steel plates.

Condition	Description
1	The connection is showing signs of rusting between plates. Seams of the connections exhibit rust staining.
2	Rusting between plates is beginning to distress the connection. Minor swelling exists.
3	Rusting between plates has caused serious distress to the connection. The plates may be badly distorted, however all connectors (rivets/bolts) are still functioning.
4	Rusting between plates has caused serious distress to the connection which warrants analysis of the bridge to ascertain the impact on the serviceability of the bridge. Some rivets or other connectors may have popped or are no longer effective.

### Notes

- ***This Smart Flag represents all occurrences of pack rust on a bridge. The quantity will always be one (1). Do not count each occurrence of pack rust.***



## Deck Cracking Smart Flag (EA)

358

This condition state language addresses deck cracking.

Condition	Description
1	The surface of the deck is cracked, but the cracks are either filled/sealed or insignificant in size and density to warrant repair activities.
2	Unsealed cracks exist which are of moderate size or density.
3	Unsealed cracks exist in the deck which are of moderate size and density.
4	Unsealed cracks exist in the deck which are of severe size and/or density.

### Notes

- ***Condition State 1 is used for decks with sealed cracks***
- ***This language refers to “moderate” and “severe” cracking. Guidelines for this are***

	Moderate	Severe
Density	Cracks at a spacing of 300 mm or larger.	Cracks at a spacing of less than 300 mm.
Size	Crack widths of 0.5 mm to 2 mm are to be considered moderate.	Crack widths of more than 2 mm are considered severe

## Soffit (or Under Surface) of Concrete Decks and Slabs Smart Flag (EA)

This condition state language addresses deck distresses through visual inspections of the deck soffit (under-surface). It is extremely valuable when the top surface of the deck is covered with an overlay.

Condition	Description
1	The under-surface of the deck or slab has no symptoms of distress. Any cracking that is present is only superficial.
2	The under-surface of the deck or slab shows no evidence that active corrosion is occurring in the deck (There is no rust staining or spalling which could be attributed to active corrosion). However, the cracking and/or efflorescence on the under-surface is light to moderate.
3	The under-surface of the deck or slab shows no evidence that active corrosion is occurring in the deck (There is no rust staining or spalling which could be attributed to active corrosion). However, the cracking and/or efflorescence on the under-surface is heavy to severe.
4	Light to moderate rust staining and/or spalling on the under-surface of the deck indicates that active corrosion is occurring in the deck.
5	Heavy to severe rust staining and/or spalling on the under-surface of the deck indicates that active corrosion is occurring in the deck.

### Notes

- ***This Smart Flag represents the entire undersurface of a deck slab, not just the undersurface of the overhang***
- ***Not for use on box girder soffits. Account for box girder soffit cracking using the appropriate box girder element.***
- ***Do not record this smart flag until Condition State 2 is reached.***

## Settlement Smart Flag (EA)

360

This condition state language addresses substructure settlement distresses which are evident during visual inspections. Its primary purpose is to identify bridges that are experiencing settlement and to provide some measure of the magnitude of that settlement. The normal CoRe condition state language for substructure elements does not address settlement.

Condition	Description
1	Some of the bridge supporting elements are showing signs of visible settlement or rotation but due to earlier repairs or other signs, the settlement appears to have stabilized.
2	Settlement or rotation of the bridge supporting elements show signs of continuing and if left unarrested could cause adverse impacts to the bridge.
3	Settlement or rotation of the bridge supporting elements is significant enough to warrant analysis of the bridge.

## Scour Smart Flag (EA)

This condition state language addresses scour distresses which are evident during visual inspections. Its primary purpose is to identify bridges that are experiencing scour and to provide some measure of the magnitude of scour. This Smart Flag may not be needed provided NBI Item 113 is used to record field observed scour.

Condition	Description
1	Scour exists at the bridge site but is of little concern to the structural integrity of the bridge.
2	Scour exists at the bridge site and if left unchecked could adversely impact the structural integrity of the bridge.
3	Scour is significant enough to warrant analysis of the bridge.

### Notes

- ***The scour smart flag should be used whenever scour is observed during the field inspection. Substructure elements should not be assigned a lower condition state because of scour.***

## Traffic Impact Damage Smart Flag (EA)

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This condition state language addresses distress of any elements due to traffic impact damage.

Condition	Description
1	Impact damage has occurred and has been repaired. Prestressing system is covered by patch concrete. Steel has been straightened or repaired.
2	Impact damage has occurred. Prestressing system is exposed, but is not impaired. Steel strength does not threaten the serviceability of the bridge.
3	Impact damage has occurred and strength of the member is impaired. Analysis is warranted to ascertain the serviceability of the bridge.

### Notes

- ***This Smart Flag should be used for structurally significant superstructure and substructure impact damage only.***
- ***Impact damage sustained by the bridge rail elements should be handled with the appropriate condition state language for those elements***
- ***Record any repaired hit in condition state 1 to keep a running total of hits on the bridge.***

## Steel Section Loss Smart Flag (EA)

This condition state language addresses element section loss.

Condition	Description
1	Section loss to the element has been repaired or cleaned and painted over
2	Section loss to the element exists and has not been repaired or painted over. Structural analysis is not yet warranted.
3	Measurable section loss to the element exists which warrants analysis to determine the serviceability of the element or the bridge.
4	Section loss has affected the load carrying capacity or serviceability of the bridge. Use this condition state only after structural analysis.

# APPENDIX

